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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,746	11/02/2001	Emil A.J. Wieser-Linhart	U 013629-1	2686

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EXAMINER	
BEISNER, WILLIAM H	

ART UNIT	PAPER NUMBER
1744	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/914,746	WIESER-LINHART, EMIL A.J.	
	Examiner	Art Unit	
	William H. Beisner	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4 and 9 is/are rejected.

7)☒ Claim(s) 5-8 and 10-13 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 02 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement filed 09 Oct. 2001 has been considered and made of record.

Comments Concerning the Claims

3. Claims 1-13 are generally narrative, failing to conform to current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors. Correction is requested.

Claim Objections

4. Claims 9 and 10 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 9 and 10 depend from claim 1 which requires a method of treating a gas stream that includes three processing steps. Claims 9 and 10 recite a device intended to perform the method of claim 1, however, claim 9 does not recite or require structures for performing the

second and third processing steps of claim 1 and claim 10 does not recite or require any structure for performing the third processing step of claim 1. As a result, these claims do not include all of the limitations required of the claims from which they depend.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hou (EP 0 042 306) in view of Johnssen (DE 4227484) and Honda (JP 60-87835).

The reference of Hou discloses a method of biologically manufacturing methanol from a methane gas stream in a multiple step cleaning process. A feed gas (methane, See Example 2) is introduced through line (62). The feed gas proceeds through multiple "cleaning" steps (each

bubble tray (22) constitutes a cleaning step) wherein the feed gas is oxidized by microorganisms into methanol.

The instant claims differ by reciting that the feed gas for the methanol formation steps is pretreated with microorganisms to remove hydrogen sulfide.

The reference of Johnssen discloses that it is known in the art to employ a raw gas of methane that is free of sulfur when synthesizing methanol from a methane raw gas (See the English language abstract).

The reference of Honda discloses that it is known in the art to treat a methane raw gas that includes hydrogen sulfide with a microbial culture (See the English language abstract).

In view of these teachings, it would have been obvious to one of ordinary skill in the art at the time the invention was made to treat a methane raw gas that includes hydrogen sulfide with microorganisms as taught by the reference of Honda for the known and expected result of removing sulfur from the raw gas prior to the formation of methanol as suggested by the reference of Johnssen.

8. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hou (EP 0 042 306) in view of Johnssen (DE 4227484) and Honda (JP 60-87835) taken further in view of Kleis et al.(EP 224889) and Torres-Cardona et al.(US 5,236,677).

The combination of the references of Hou, Johnssen and Honda has been discussed above.

Claim 2 differs by reciting that the hydrogen sulfide is oxidized by microorganisms on a "sprinkling body-solid bed".

The reference of Kleis et al. discloses that it is known in the art to remove hydrogen sulfide in a gas stream by passing the gas stream through a packed-bed (1) the is sprinkled by a liquid recirculation line (5) wherein the gas stream is contacted with microorganisms for oxidizing the hydrogen sulfide.

In view of this teaching and in the absence of a showing of criticality and/or unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to contact the hydrogen sulfide oxidizing microorganisms in a gas/liquid contacting system as disclosed in the reference of Kleis et al. for the known and expected result of providing an alternative means recognized in the art to achieve the same result, contacting a gas stream containing hydrogen sulfide with a liquid of hydrogen sulfide oxidizing microorganisms.

With respect to the maintenance of pH as recited in claim 2, the reference of Torres-Cardona et al. discloses that it is well known in the art to maintain the pH of a liquid recirculation stream in a gas/liquid contacting system of biological hydrogen sulfide removal system (See column 3, lines 30-46).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the optimum manner in which to maintain the pH of the treatment system in terms of the specific pH controlling agents employed while maintaining the proper nutrient concentrations for maintaining the viability of the microorganisms in the treatment system.

With respect to claim 3, optimization of the required reagents would have been obvious for the known and expected result of providing concentrations of reagents required based merely on the concentration of the hydrogen sulfide in the gas stream to be treated.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hou (EP 0 042 306) in view of Johnssen (DE 4227484); Honda (JP 60-87835); Kleis et al.(EP 224889) and Torres-Cardona et al.(US 5,236,677) taken further in view of Sonta et al.(US 4,931,262).

The combination of the references of Hou, Johnssen, Honda, Kleis et al. and Torres-Cardona et al. has been discussed above.

While the modified primary reference discloses the use of a clarifier device (See Torres-Cardona et al., CL-OI), the reference is silent as to the use of a flocculating agent and filter press.

The reference of Sonta et al. discloses that the use of both flocculating agents and filter presses are known in the art for separating elemental sulfur from a liquid containing the sulfur resulting from a gas treatment process (See Figure 1 and column 6, line 67, to column 7, line 4).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to determine the optimum manner in view of the known methods of collection to collect or remove the elemental sulfur from the washing liquid based merely on the specific purpose of the sulfur recovery as suggested by the reference of Sonta et al.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Torres-Cardona et al.(US 5,236,677) in view of Sonta et al.(US 4,931,262).

The reference of Torres-Cardona et al. discloses a gas treating device that includes a "sprinkling body-solid bed-device" (BR-01) wherein the gas to be treated flows in a counter-current direction relative to a washing liquid (08,09,10). The washing system includes a sump in the bed device with a line and nozzles (10). The washing system includes a draw-off line (11)

with a separation device (CL-01) and circulation line (12, 10) that extends to the nozzles located below a droplet-removing device located at the outlet for the desulfurized gas (See Figure 1).

While the reference discloses a device for separating and collecting elemental sulfur, the instant claims differ by reciting the use of a flocculating agent (polyelectrolyte source) and a filter press for separation and collection of the elemental sulfur in the washing liquid.

The reference of Sonta et al. discloses that the use of both flocculating agents and filter presses are known in the art for separating elemental sulfur from a liquid containing the sulfur resulting from a gas treatment process (See Figure 1 and column 6, line 67, to column 7, line 4).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to determine the optimum manner in view of the known methods of collection to collect or remove the elemental sulfur from the washing liquid based merely on the specific purpose of the sulfur recovery as suggested by the reference of Sonta et al. As a result, the use of feed lines and filter presses within the system of the device of Torres-Cardona et al. would have been well within the purview of one having ordinary skill in the art for the simple result of providing an alternative art recognized means for achieving the same result.

With respect to the sources for the maintenance of pH, the reference of Torres-Cardona et al. discloses that it is well known in the art to maintain the pH of a liquid recirculation stream in a gas/liquid contacting system of biological hydrogen sulfide removal system (See column 3, lines 30-46).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the optimum manner in which to maintain the pH of the treatment system in terms of the specific pH controlling agents employed while

maintaining the proper nutrient concentrations for maintaining the viability of the microorganisms in the treatment system.

Allowable Subject Matter

11. Claims 5-8 and 10-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 5-8, while the prior art of record suggests a multiple step gas treatment process for the generation of methanol from a raw gas stream containing methane and hydrogen sulfide, the prior art of record fails to teach or fairly suggest a processing method that includes microbial oxidation performed using two separate "sprinkling body-solid beds" with a mixed population of bacteria and yeast.

With respect to claims 10-13, while the prior art of record suggest a device for treating a gas stream containing methane and hydrogen sulfide to remove the hydrogen sulfide with a device supporting hydrogen sulfide oxidizing microorganisms on a solid body bed, the prior art of record fails to teach or fairly suggest connecting the hydrogen sulfide removing bed with a separate bed including a grown mixed population of bacteria and yeasts for performing methane oxidation to form methanol wherein the treated raw gas flows in a co-current manner relative to the washing liquid system for the bed.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Beisner whose telephone number is 571-272-1269. The examiner can normally be reached on Tues. to Fri. and alt. Mon. from 6:15am to 3:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 571-272-1281. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William H. Beisner
Primary Examiner
Art Unit 1744

WHB